DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/28/2009 has been entered.

Preliminary Remarks

2. Applicant's amendment overcomes the 102(b) rejection in paragraphs 3, 7 and 11 and the 35 USC 103(a) rejections in paragraphs 16, 21, 24, 28, 31 and 34 of the Office Action mailed on 12/24/2008.

3. Claims 16-19 and 27-37 are pending further action upon the merits.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 14-19 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Regarding claims 14-19 and 31, the word "means" is preceded by the word(s) "transport" in an attempt to use a "means" clause to recite a claim element as a means for performing a specified function. However, since no function is specified by the word(s) preceding "means," it is impossible to determine the equivalents of the element, as required by 35 U.S.C. 112, sixth paragraph. See *Ex parte Klumb*, 159 USPQ 694 (Bd. App. 1967).

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 14 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by von Nordenskjöld (US 6,395,173 B1).

9. For claim 14, von Nordenskjöld discloses a method and device for biologically treating a fluid such as waste water in order to produce a biogas that includes a tank (tank 2) that has a mixing and acidifying region (region 2) which is being interpreted as the pre-acidifying region of the instant application, a heavy load region (region 7), a light load region (region 9) and a sedimentation region (region 10) where the regions are separated by partition walls (walls 12, 13 & 14; col. 2 lines 48-53 & 60-63). The heavy and light load regions are covered with a sheeting (sheet 15) that forms a gas reservoir over the two sections and this sheeting or cover includes submerging tabs (tabs 30) that

provides a perfect gas seal (col. 4 lines 39-43). Finally, the material within the mixing and acidifying region or pre-acidifying region is transported to the heavy load region by way of a metering pump (pump 18) and conduit (conduit 31; 3 lines 27-29) where the metering pump and conduit are the art equivalent of the transport means of the instant application.

10. With regards to the bacteria and pH-value of the pre-acidification region, von Nordenskjöld discloses using an activated sludge within this region and using two independent and different stocks of bacteria (col. 3 liens 18-22 & 45-47). Also, the pH-value of this region is adjusted by additives delivered from an additive device (device 16; col. 3 lines 7-10) and therefore, fully capable of adjusting the pH of the mixing and acidifying region to value that is not greater than 6. For the heavy and light load regions, these regions contain activated-sludge beds (col. 3 lines 47-48) and are the regions that produce the biogas, hence the use of a sheeting or cover to provide a gas tight seal over both regions.

11. With regards to claim 18, von Nordenskjöld discloses using devices to aerate the waste water in the mixing and acidifying region (col. 3 lines 24-16) and a metering pump near the bottom of the tank in order to remove material into the heavy load region as was discussed above.

12. Therefore, von Nordenskjöld meets the limitations of claims 14 and 18.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

15. Claims 15 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over von Nordenskjöld (US 6,395,173 B1) in view of Fassell et al. (US 3,920,548).

16. For claims 15 and 27, von Nordenskjöld discloses using an orifice (orifice 19) in the upper part of the partition wall (wall 13) to allow material to pass from the heavy load region to the light load region (col. 4 lines 15-17). However, von Nordenskjöld is silent regarding a device to withdraw material from the top region of the mixing and acidifying region such as a spillway.

17. Fassell discloses a wet oxidation process for treating waste water that includes a horizontally elongated reactor that has several chambers separated by baffles (baffles 26). For claims 15 and 27, the baffles of Fassell include notches (notches 28) at the top of each baffle that serves to make the flow of fluid from one chamber to the next be

essentially one-way (col. 10 lines 6-11). Furthermore, these notches are being interpreted as the spillway of the instant application.

18. The notches of Fassell solves the problem of removing material from the top of one chamber, in this case the pre-acidifying region, and shows that the use of this structure was known at the time of the instant application. Barring any alleged unexpected results, it would have been obvious for one of ordinary skill in the art to employ the notch as suggested by Fassell within the partition separating the mixing and acidifying region and heavy load regions of von Nordenskjöld in order to obtain the predictable result of moving treated fluid from one chamber to the next.

19. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over von Nordenskjöld (US 6,395,173 B1) in view of Fassell et al. (US 3,920,548) and in further view of Reynell (U.S. 5,958,756).

20. For claim 28, von Nordenskjöld and Fassell are silent regarding a nozzle used to withdraw material from the top of the acidification tank.

21. Reynell teaches a fluids digestion vessel for treating waste that for claim 28 includes a conduit or spillway so that the flow of liquid can occur by gravity (col. 3 lines 59-60) which is in the upper portion of the tank (Fig. 1) where the inlet of the conduit is being interpreted as a nozzle. Barring any alleged unexpected results, it would be obvious to one of ordinary skill in the art to employ the conduit or nozzle suggested by Reynell within the waste water treatment of von Nordenskjöld and Fassell in order to obtain the predictable result of removing material from the top of the tank.

22. Claims 16, 19 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over von Nordenskjöld (US 6,395,173 B1) in view of Mann (U.S. 2003/0213702).

23. For claim 16, von Nordenskjöld teaches that the effluent in the acidifying range is mixed with an agitator that is driven by a motor (col. 3 lines 16-17; Fig. 1). While von Nordenskjöld does not specify that the mixer is a stirrer, but based on the figure of the reference, it is implied that the mixer is a mechanical agitator like a stirrer.

24. Mann discloses a waste disposal apparatus for receiving marine waste from a macerating marine toilet where the waste is sent to a disposal tank consisting of two chambers. For claim 16, the first chamber or electrolysis chamber holds the waste initially until the electrolysis chamber is flushed under the direction of an operator or a controller. With regards to claim 16, Mann teaches an electronic controller that operates the waste treatment apparatus (page 4 [006] lines 1-3, Fig. 3 element 55). The controller of Mann monitors the level in the tank at a selected level in order to warn the operator that the tank is full (page 4 [0068] lines 2-4) or to discharge flocculation polymers to settle the solid portion of the waste out of solution (page 4 [0067] lines 10-12). Furthermore, for claim 29, the controller of Mann would be fully capable of controlling the agitator of von Nordenskjold. It would be obvious to one of ordinary skill in the art to employ the controller as suggested by Mann within the teachings of von Nordenskjöld in order to control the level of waste within the tank. The suggestion for doing so at the time would have been in order to prevent surplus waste from accumulating in the chamber (page 5 [0068] lines 7-8).

25. For claim 19, von Nordenskjöld does not teach a controller that operates the floatation device and the withdrawal device.

26. With regards to claim 19, Mann teaches an electronic controller that operates the waste treatment apparatus (page 4 [006] lines 1-3, Fig. 3 element 55). The controller of Mann monitors the level in the tank at a selected level in order to warn the operator that the tank is full (page 4 [0068] lines 2-4) or to discharge flocculation polymers to settle the solid portion of the waste out of solution (page 4 [0067] lines 10-12). It would be obvious to one of ordinary skill in the art to employ the controller as suggested by Mann within the teachings of von Nordenskjöld in order to control the level of waste within the tank. The suggestion for doing so at the time would have been in order to prevent surplus waste from accumulating in the chamber (page 5 [0068] lines 7-8).

27. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over von Nordenskjöld (US 6,395,173 B1) in view of Umezawa et al. (US 2004/0245184 A1).

28. With regards to the limitation of claim 17, von Nordenskjöld discloses a pump to remove the treated material from the acidification or pre-acidification chamber, but is silent regarding the use of a sieve or filter.

29. For claim 17, Umezawa discloses a waste water treatment deice and method that uses a filter (filter 13) or sieve connected to a pump (pump 6) via a pipe (pipe 8; [0176])) and this filter is being interpreted as removing filtrate from the "upper region" of the tank. Therefore, it would be obvious for one of ordinary skill in the art to employ the filter as suggested by Umezawa within the tank of von Nordenskjöld in order to obtain

the predictable result of filtering the waste material during transfer to the heavy load region.

30. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over von Nordenskjöld (US 6,395,173 B1) in view of Wilkie (US 2005/0167359 A1) (continuation in part of application 10/277,486 filed on October 22, 2002).

31. Regarding a mechanical comminution device, von Nordenskjöld is silent about a mechanical pre-treatment of the raw materials.

32. Wilkie discloses a fixed-film anaerobic digestion of flushed waste where the slurry is pre-treated by mechanical means. For claims 30, Wilkie discloses pre-treating the raw materials by mechanical communition ([0055]). Therefore, it would be obvious to one of ordinary skill in the art to employ the pre-treatment as suggested by Wilkie in order to process the raw waste of von Nordenskjöld. The suggestion for doing so at the time would have been in order to render small or reduce the size of the suspended solids ([0055]).

33. Claims 31, 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over von Nordenskjöld (US 6,395,173 B1) in view of Ahn et al. (*Water Research*. Vol. 35, no. 18, pp4267-4276, 2001).

34. For claim 31, von Nordenskjöld discloses a method and devise for biologically treating a fluid such as waste water in order to produce a biogas that includes the step of using tank (tank 2) that has a mixing and acidifying region (region 2), a heavy load

region (region 7), a light load region (region 9) and a sedimentation region (region 10) where the regions are separated by partition walls (walls 12, 13 & 14; col. 2 lines 48-53 & 60-63). The heavy and light load regions are covered with a sheeting (sheet 15) that forms a gas reservoir over the two sections and this sheeting or cover includes submerging tabs (tabs 30) that provides a perfect gas seal (col. 4 lines 39-43). Finally, the material within the mixing and acidifying region or pre-acidifying region is transported to the heavy load region by way of a metering pump (pump 18) and conduit (conduit 31; 3 lines 27-29).

35. With regards to the bacteria and pH-value of the pre-acidification region, von Nordenskjöld discloses using an activated sludge within this region and using two independent and different stocks of bacteria (col. 3 liens 18-22 & 45-47). Also, the pH-value of this region is adjusted by additives delivered from an additive device (device 16; col. 3 lines 7-10), but does not specify the step of where the pH value of the acidifying tank is no greater than a pH of 6. For the heavy and light load regions, von Nordenskjöld discloses the step where these regions contain activated-sludge beds (col. 3 lines 47-48) and are the regions that produce the biogas, hence the use of a sheeting or cover to provide a gas tight seal over both regions.

36. However, von Nordenskjöld discloses an acidifying tank, but is silent regarding a pre-acidifier.

37. Ahn discloses a pre-acidification process of treating brewery wastewater that includes a pre-acidification reactor. For claim 31 includes the step of using a pre-acidification reactor (page 4268, introduction, paragraph 9) prior to sending the waste

stream to a second reactor or tank (Fig. 1) where the pre-acidified material is drawn from the top of the tank (Fig. 1). The pre-acidification step leads to maximizing the hydrogen utilization of the microorganisms within the reactor and continuous granule formation (page 4268, introduction, paragraph 7). Moreover, the step of sending only pre-acidified materials is implicit within Ahn since material is removed from the top of the pre-acidification tank (Fig. 1). Therefore, it would be obvious to one of ordinary skill in the art to employ the pre-acidification step as suggested by Ahn within the wastewater treating method of von Nordenskjöld. The suggestion for doing so at the time would have been in order to increase the organic loading rate and removal efficiency of the reactor (page 4267 introduction paragraph 2).

38. For claim 34, von Nordenskjöld teaches aerating the effluent with air or oxygen which reads on a floatation that is used to mix the fluid in the acidifying range/chamber (col. 3 lines 24-26). Also, von Nordenskjöld teaches using the pump (pump 18) to pull fluid from the bottom of the acidifying range (col. 3 lines 27-29). The step of not withdrawing material that has been pre-acidified is implicit in the withdrawal step of von Nordenskjöld.

39. Finally, for claim 35, von Nordenskjöld discloses the step where the materials entering the acidifying tank comprise brewery waste water and excess sludge or solid and a liquid (col. 2 lines 65-67; col. 5 lines 32-37).

40. Claims 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over von Nordenskjöld (US 6,395,173 B1) in view of Ahn et al. (*Water Research*. Vol. 35, no. 18, pp4267-4276, 2001) and in further view of Copa et al. (US 4,919,815).

41. For claim 32, von Nordenskjöld discloses a method and devise for biologically treating a fluid such as waste water in order to produce a biogas that includes the step of using tank (tank 2) that has a mixing and acidifying region (region 2), a heavy load region (region 7), a light load region (region 9) and a sedimentation region (region 10) where the regions are separated by partition walls (walls 12, 13 & 14; col. 2 lines 48-53 & 60-63). The heavy and light load regions are covered with a sheeting (sheet 15) that forms a gas reservoir over the two sections and this sheeting or cover includes submerging tabs (tabs 30) that provides a perfect gas seal (col. 4 lines 39-43). Finally, the material within the mixing and acidifying region or pre-acidifying region is transported to the heavy load region by way of a metering pump (pump 18) and conduit (conduit 31; 3 lines 27-29).

42. For claim 32, Ahn discloses withdrawing material from the top of the pre-acidifying tank, but both von Nordenskjöld and Ahn are silent about letting the materials settle and withdrawing the material from an upper portion of the tank through a sieve.

43. For claims 32 and 33, Copa the step where liquid in the anaerobic zone flows upward through a filter bed or sieve (col. 4 lines 49-51, Fig. 2 element 20) that retains some of the solids as the fluid flows to the aerobic zone. The transportation means of moving the fluid from the first tank to the second is due to an upward flow of air and liquid that is used to re-suspend the solids within the tank and promotes the flow of the

waste fluid to the aerobic tank (col. 2 lines 34-36). The filter bed also serves to retain the majority of solids within the first reactor which allows further treatment of the solids within the anaerobic vessel. The solids are settled and then this is followed by another aeration step within the first aerobic treatment zone (col. 3 lines 48-51). It would have been obvious to one of ordinary skill in the art to employ the steps of filtering and settling as suggested by Copa within the teachings of von Nordenskjöld and Ahn in order to retain the solids within the fluid digester. The suggestion for doing so at the time would have been in order to minimize the amount of residual solids wasted during the treatment process (col. 2 lines 34-36).

44. Claims 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over von Nordenskjöld (US 6,395,173 B1) in view of Ahn et al. (*Water Research*. Vol. 35, no. 18, pp4267-4276, 2001) and in further view of Wilkie (US 2005/0167359 A1) (continuation in part of application 10/277,486 filed on October 22, 2002).

45. Regarding a mechanical comminution step for processing the incoming raw material, von Nordenskjöld and Ahn are silent.

46. Wilkie discloses a fixed-film anaerobic digestion of flushed waste where the slurry is pre-treated by mechanical means. For claims 36 and 37, Wilkie discloses the step of pre-treating the raw materials by mechanical comminunition ([0055]). Therefore, it would be obvious to one of ordinary skill in the art to employ the pre-treatment step as suggested by Wilkie in order to process the raw waste of von Nordenskjöld and Ahn.

The suggestion for doing so at the time would have been in order to render small or reduce the size of the suspended solids ([0055])

Response to Arguments

47. Applicant's arguments with respect to claims 14-19 and 27-37 have been considered but are moot in view of the new ground(s) of rejection.

48. The new grounds of rejection is made in view of US 6,395,173 B1 that discloses a system and method for treating waste water that includes treating or acidifying the waste material in a first tank before sending the waste water to a fermentation tank.

49. With regards to Applicant's argument relating to the transport means, it is unclear if applicant is invoking 112 sixth paragraph, however, the pump and conduit of von Nordenskjöld is the art equivalent of the transport means and is fully capable of separating material from the "pre-acidifying" tank and transporting the separated material to a fermentation region.

50. With regards to Applicants argument on page 9 second full paragraph, the applied reference of von Nordenskjöld is fully capable of segregating material from the "pre-acidifier" and transporting this material to the heavy load region.

51. With regards to Applicant's argument stating on the last paragraph of page 9 and continuing to the top of page 10 is moot in view of the new grounds of rejection. Moreover, the step of segregating the material is implicit in the combined references of von Nordenskjöld and Ahn.

52. Regarding Applicant's argument that Copa does not correct the deficiency within von Nordenskjöld and Ahn, the Examiner respectfully disagrees. Copa discloses the step of settling the treated fluid and corrects the deficiency within von Nordenskjöld and Ahn.

53. With regards to Applicant's arguments on the bottom of page 10 and through the top of page 11, these have been addressed by the newly applied reference of von Nordenskjöld.

54. Therefore, the rejections are proper and the claims stand rejected.

Conclusion

55. No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL HOBBS whose telephone number is (571)270-3724. The examiner can normally be reached on Monday-Thursday 7:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Marcheschi can be reached on (571) 272-1374. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. H./
Examiner, Art Unit 1797

/William H. Beisner/
Primary Examiner, Art Unit 1797